

What is Claimed is:

1. - A remote laser welding system comprising a laser beam generator and an optical unit including mirror orienting means and focusing means, to orient and focus the laser beam respectively inside a spatial sector, said optical unit consisting of an optical head and said orienting means being arranged to further orient said spatial sector on a vertical plane.

2. - System according to claim 1, wherein said orienting means comprise a stationary mirror to deviate said laser beam from a vertical direction to a horizontal direction, and a mobile mirror pivoting on a first horizontal axis arranged on the plane of said mobile mirror orthogonally to said horizontal direction of said laser beam and turning on a second horizontal axis coinciding with said horizontal direction of said laser beam, and high dynamic actuating means to control the angular movements of said mobile mirror respectively on said first axis and said second axis.

3. - System according to claim 2, wherein the pivoting angle of said first axis is in the order of  $\pm 15^\circ$ .

4. - System according to claim 2, wherein the rotation angle of said second axis is in the order of  $\pm 140^\circ$ .

5. - Welding system according to claim 1, wherein said focusing means include a focusing lens which is vertically moveable upstream to said stationary mirror.

6. - System according to claim, wherein said spatial

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sector is a spherical crown sector.

7. - System according to claim 1, wherein said optical head is translatable along a vertical axis.

8. - System according to claim 1, wherein said optical head is applied to a robot for welding bodies and parts of motor vehicles.

9. - A remote laser welding method comprising the steps of generating a laser beam and of orienting and focusing said laser beam in a spatial sector on a zone to be welded, and further comprising the step of orienting said spatial sector on a vertical plane.

10. - Method according to claim 9, wherein said laser beam is deviated from an incoming vertical direction to a horizontal position and is consequently oriented around a first horizontal axis, which is orthogonal to said horizontal direction, as well as around a second horizontal axis, coinciding with said direction.

11. - Method according to claim 10, wherein said horizontal direction is vertically moveable.

12. - Method according to claim 10, wherein said horizontal direction is turnable around said vertical direction.

13. - Method according to claim 11, wherein said horizontal direction is turnable around said vertical direction.

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14. - Method according to claim 9, wherein said spatial sector is a spherical crown sector.

15. - Method according to claim 9 applied to the welding of bodies and parts of motor vehicles by means of a Cartesian robot which continuously tracks the focused spot during the welding phases, while the body or part being welded is kept stationary.

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